

1 CLAIMS

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3 We claim:

4 A polyisocyanate composition comprising:

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6 (1) a polyisocyanate; and

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8 (2) a monomeric carbodiimide in amount effective in improving the humidity
9 resistance of the polyisocyanate.

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11 2. The polyisocyanate composition of claim 1 wherein the polyisocyanate is
12 polymeric diphenylmethylene diisocyanate.

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14 3. The polyisocyanate composition of claim 2 wherein the monomeric carbodiimide is
15 selected from the group consisting of N, N'-dicyclohexyl carbodiimide, N,N'-
16 diisopropyl carbodiimide, N,N'-ditert-butyl carbodiimide, N,N'-di-p-tolyl
17 carbodiimide, and mixtures thereof.

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19 4. The foundry binder system of claim 3 wherein the amount of monomeric
20 carbodiimide is from 0.1 weight percent to 5.0 weight percent, based upon the
21 weight percent of the isocyanate component.

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23 5. A foundry binder system comprising:

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25 A. a phenolic resin component; and

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27 B. a polyisocyanate component comprising:

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29 (1) an organic polyisocyanate;

(2) a non reactive organic solvent; and

(3) a monomeric carbodiimide in amount effective in improving the humidity resistance of the polyisocyanate.

6 The foundry binder system claim 5 wherein the phenolic resin component comprises a (a) a polybenzylic ether phenolic resin prepared by reacting an aldehyde with a phenol such that the molar ratio of aldehyde to phenol is from 1.1:1 to 3:1 in the presence of a divalent metal catalyst, and (b) a solvent in which the resole resin is soluble.

7. The foundry binder system of claim 6 wherein the phenol is selected from the group consisting of phenol, o-cresol, p-cresol, substituted phenols, and mixtures thereof.

8. The foundry binder system of claim 7 wherein the aldehyde is formaldehyde.

9. The foundry binder system of claim 8 wherein the ratio of hydroxyl groups of the polybenzylic ether phenolic resin to the polyisocyanate groups of the polyisocyanate hardener is from 0.80:1.2 to 1.2:0.80.

10. The foundry binder system of claim 5 where the monomeric carbodiimide is selected from the group consisting of N, N'-dicyclohexyl carbodiimide, N,N'-diisopropyl carbodiimide, N,N'-ditert-butyl carbodiimide, N,N'-di-p-tolyl carbodiimide, and mixtures thereof.

- 1 11. The foundry binder system of claim 10 wherein the amount of monomeric
2 carbodiimide is from 0.1 weight percent to 5.0 weight percent, based upon the
3 weight of the isocyanate component.
4
- 5 12. A foundry mix comprising:
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7 A. a major amount of an aggregate; and
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9 B. an effective bonding amount of the binder system of claims 5, 6, 7, 8, 9, 10, or
10 11.
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- 12 13. A process for preparing a foundry shape which comprises:
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14 (a) forming a foundry mix as set forth in claim 12;
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16 (b) forming a foundry shape by introducing the foundry mix obtained from step
17 (a) into a pattern;
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19 (c) contacting the shaped foundry binder system with a tertiary amine catalyst;
20 and
21 (d) removing the foundry shape of step (c) from the pattern.
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- 23 14. The process of claim 13 wherein the tertiary amine catalyst is a gaseous tertiary
24 amine catalyst.
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- 1 15. The process of claim 14 wherein the amount of said binder composition is about
2 0.6 percent to about 5.0 percent based upon the weight of the aggregate.
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- 4 16. The process of claim 15 wherein the tertiary amine catalyst is a liquid tertiary
5 amine catalyst.
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- 7 17. The process of casting a metal which comprises:
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 - 9 (a) preparing a foundry shape in accordance with claim 16;
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 - 11 (b) pouring said metal while in the liquid state into and a round said
12 shape;
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 - 14 (c) allowing said metal to cool and solidify; and
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 - 16 (d) then separating the molded article.
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